Five-Year Review Report

First Five-Year Review Report
for
Petoskey Municipal Well Field Superfund Site

Petoskey, Michigan

January 2005

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Five-Year Review Report

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List of Acronyms

AOC	Administration of Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
U.S. EPA	United States Environmental Protection Agency
GSI	Groundwater Surface Interface
MDEQ	Michigan Department of Environmental Quality
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PMC	Petoskey Manufacturing Company
PPB	Part Per Billion
PRP	Potentially Responsible Party
QAPP	Quality Assurance
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
VOC	Volatile Organic Compound

Executive Summary

The remedy for the Petoskey Municipal Well Field Superfund Site in Petoskey, Michigan included:

- The excavation and off-site disposal of approximately 2,500 cubic yards of contaminated soil.
- The installation and operation of a Soil Vapor Extraction (SVE) system to remove volatile organic compounds (VOCs) from subsurface soils.
- Monitored natural attenuation of the groundwater.

The site achieved construction completion with the signing of the Preliminary Close Out Report on the February 18, 2000. The trigger for this five-year review was the Remedial Action, construction start date on November 1, 1999.

This is the first five-year review for the Site. The remedy is functioning as designed. The immediate threats have been addressed and the remedy is protective in the short term. In order for the remedy to be protective in the long-term, deed restrictions controlling the use of groundwater and long-term groundwater monitoring plan, need to be put in place to prevent exposure to contaminated groundwater.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from WasteLAN)*: **Petoskey Municipal Well Field**

EPA ID *(from WasteLAN)*: MID006013049

Region: 5	**State:** MI	**City/County:** Petoskey/Emmet

SITE STATUS

NPL status: X Final ☐ Deleted ☐ Other (specify) _____

Remediation status (choose all that apply): ☐ Under Construction **x** Operating ☐ Complete

Multiple OUs?* X YES ☐ NO	**Construction completion date:**2/18/2000

Has site been put into reuse? X YES ☐ NO

REVIEW STATUS

Lead agency: X EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Giang-Van Nguyen

Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA Region 5

Review period:** 04 / 15 /2004 to 11/01/2004

Date(s) of site inspection: 09 / 21 / 2004

Type of review:

X Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: X 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

x Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____
☐ Construction Completion ☐ Previous Five-Year Review Report
☐ Other (specify) _____

Triggering action date *(from WasteLAN)*: 11 /01 /1999

Due date *(five years after triggering action date)*: 11 /01 /2004

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.
Issues:

In April 2003, the former Petoskey Manufacturing Company facility was sold through Chapter 7 Bankruptcy Trustee to Perazza Products, LLC., a Michigan corporation, for redevelopment. The redevelopment plan includes multi-family residential use and a small amount of commercial use. The demolition of the PMC building was initiated in July 2004. The demolition included the removal of the existing building and building foundation. The demolition plan also included the excavation and off-site disposal of any contaminated soils that exceed Michigan Department of Environmental Quality (MDEQ) Residential Cleanup Criteria for Direct Contact, Volatilization to Indoor Air and Groundwater/Surfacewater Interface Protection. During the excavation, the soil under the northwest corner of the building showed a TCE concentration of approximately 1600 ppb. The TCE concentrations declined with depth to approximately 120-140 ppb. All excavated areas were filled in with clean soils and there is no soil above direct contact criteria at the surface and down to seven feet below grade. The soils that exceed only GSI protection and/or GSI protection criteria still remain on the Site. These soils will be removed from the Site only if excavation of these areas are required for the new development. The soils that exceed only GSI protection and/or GSI protection criteria were on the western portion of the Site which could impact the groundwater by leaching, were covered with an impermeable liner to prevent the infiltration during the winter. The groundwater monitoring wells located inside the footprint of the future buildings will be plugged and abandoned. The construction of the new building is scheduled to start in 2005.

The Agency has received a letter dated November 17, 2004 from the Michigan Department of Environmental Quality (MDEQ) providing general comments on the Draft Five-Year Review Report for the Petoskey Site. The letter raised concerns regarding zinc and mercury levels, the existing monitoring system, the Natural Attenuation Plan, and additional deed restrictions necessary. The letter also stated that MDEQ could not concur with the Agency as to the remedy being protective for either the short-term or the long-term based on their concerns. On February 2, 2005, the Agency provided written response to MDEQ's comments. Although the MDEQ's concerns has been considered, the Agency still believe that the remedy is protective for the short-term (see Attachment 6).

Long-term groundwater monitoring has not been implemented and it is expected to be initiated in late fall 2005.

A deed restriction regarding the future use of the groundwater, as required by the final ROD, has not been implemented on the Petoskey Manufacture parcel.

Recommendations and Follow-up Actions:

The long-term monitoring plan for groundwater should be implemented.

The new owner of the Petoskey Manufacture parcel needs to place the required deed restrictions into their Due Care plan.

The City of Petoskey is willing to include the deed restriction on the City contract with the developer. EPA will work with the City to have a deed restriction inplace for the Site.

Protectiveness Statement(s):

The remedy at the Site currently protects human health and the environment in the short-term because all soils that exceed a direct contact threat and vapor intrusion or have potential to leach to groundwater at levels in excess of chemical-specific ARARs have been or will be removed. However, in order for the remedy to be protective in the long-term, the following actions need to be taken:

-Place the deed restriction for the future use of groundwater on the property

-Implement the long-term monitoring plan

Other Comments: None

Five-Year Review Report

I. Introduction

The purpose of five-year reviews is to determine whether the remedy at a site is expected to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA) Region 5 has conducted a five-year review of the remedial actions implemented at the Petoskey Municipal Well Field Superfund site in Petoskey, Michigan ("the Site"). This review was conducted from April 2004 through November 2004. This report documents the results of the review.

This is the first five-year review for the Site. The triggering date for this statutory review is November, 1999, which is the construction start date as shown in U.S. EPA's WasteLAN database. The five-year review is required since hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

This report will be placed in the Petoskey Municipal Well Field Administrative Record file located at U.S. EPA Region 5's office at 77 West Jackson Boulevard, Chicago, Illinois, and in the

local document repository, which is located at Petoskey Public Library, 451 East Mitchell Street, Petoskey, Michigan.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Petoskey Manufacturing Company (PMC) was identified as a PRP by U.S. EPA and MDEQ	1981
Removal of contaminated soil from the west side of the PMC building	1982
Proposed listing on U.S. EPA NPL	12/30/1982
Final listing on U.S. EPA NPL	09/08/1983
U.S. EPA negotiated AOC with PMC to conduct further hydrological studies at the site	8/23/1984
First ROD (Interim) signed for providing on-line treatment of groundwater	06/15/1995
MDEQ completed the Remedial Investigation	02/1998
U.S. EPA completed Feasibility Study	09/1998
Second ROD signed for the soil and final groundwater remedies	09/30/1998
Remedial design start	7/27/1999
Remedial design complete	10/30/1999
Superfund State Contract, Cooperative Agreement signed	10/08/1999
Actual remedial action start	9/22/1998
On-site construction start	11/01/1999
Pre-final and final inspection of remedial action	01/2000
Preliminary Close-out Report signed	2/18/2000

II. Background

Physical Characteristics

The Petoskey Municipal Well Field Superfund site, which included the Ingalls Municipal Well (Ingalls Well) and the Petoskey Manufacturing Company (PMC) property is located within the City of Petoskey, Emmet County, Michigan. The City is a resort community on Little Traverse Bay, Lake Michigan. The City has full-time population of about 6,000 but these numbers swell in the summer with part-time residents and in the winter with skiers. The Emmet County community includes what is described as magnificent lakefront homes, luxury seasonal-use condominiums, a world class golf course, and adjacent marina.

The PMC facility is located at 200 West Lake Street in a residential area of the City of Petoskey. The PMC facility is bordered to the north by a condominium complex, to the east and south by several residences and to the west by a vacant lot. Approximately 500 feet north of the PMC property is Little Traverse Bay of Lake Michigan. Bear Creek, which drains into Little Traverse Bay, is located approximately 500 feet east of the PMC property. Immediately south of Lake Street, behind the row of houses, is a steep bluff running approximately parallel to the shoreline.

The Ingalls Well was built in the 1920's and is located approximately 700 feet northwest of PMC and is about 50 feet from Lake Michigan shoreline. The Ingalls Well used to be the primary water supply well for the City.

PMC was identified by U.S. EPA and MDEQ as the sole source of contamination at the Ingalls Well. Because of the connection between PMC and the Site, the Site is also commonly known as the "PMC Site."

Land and Resource Use

PMC was a small fabricating operation that was established in 1946 as a die cast manufacturer and continued with painting operations into the late 1960's. The company then began die casting zinc parts for the automotive industry and continued its operation until fall of 2000 when the business closed .

The primary product line included door handles, hood ornaments and emblems. Molten zinc was cast into parts and then trimmed, polished, buffed and painted as necessary. Trichloroethylene (TCE) was use as a solvent to clean paint masks. Xylene was used as paint thinner and solvent.

In April 2003, the former Petoskey Manufacture facility was sold through Chapter 7 Bankruptcy Trustee to Perazza Products, LLC., a Michigan corporation (the developer). In July 2004, the developer completely demolished the existing building, including its foundation and removed

contaminated soils that exceeded MDEQ Residential Cleanup Criteria for Direct Contact, Volatilization to Indoor Air and GSI protection. The existing building and contaminated soils were sent off-site for disposal. The construction of the new residential apartment building started in September 2004.

History of Contamination

Contamination at the Site was first discovered in September 1981 when drinking water samples were collected. The samples, when tested, showed high levels of trichloroethylene (TCE), cis-1,2 dichloroethylene (DIS), and trihalomethanes. The City of Petoskey requested assistance from the Michigan Department of Natural Resources, now the Michigan Department of Environmental Quality (MDEQ), to aid in identifying responsible parties and to conduct a hydrogeological investigation to find the source of the contamination.

In response to the contamination detected at the Site, the MDEQ conducted soil sampling at the PMC facility. These samples were collected January 24, 1982 and February 16, 1982. High levels of several organic chemicals were detected. Based on these testing results, the MDEQ installed five monitoring wells and collected soil borings at six locations around the contaminated well. Water from the well was found to have VOCs, SVOCs and inorganic contaminants. The listing included xylene, toluene, trichloroethylene and ethyl benzene. MDEQ subsequently asked PMC to determine the extent of the contaminated soils, and to remove and dispose of the material. In its operations, PMC had disposed of spent solvents directly to the ground surface surrounding the plant. For this reason, U.S. EPA and MDEQ identified PMC as the source of the volatile organic compound contamination.

Initial Response

In 1982, under the direction of the MDEQ, PMC excavated the contaminated soils at the Site, and the area was backfilled with clean compacted soil and graded to provide drainage. The soil was next covered with a synthetic liner and six inches of gravel. In July 1983, U.S. EPA evaluated PMC Site using the Hazard Ranking System. The PMC Site was added to the National Priorities List on September 8, 1983.

In 1984, U.S. EPA negotiated a removal administrative order by consent (AOC) with PMC. This Order required PMC to conduct further hydrogeological studies. PMC retained an environmental consultant and completed the work under the direction of U.S. EPA and MDEQ. The work included the installation of four monitoring well clusters, groundwater and soil sampling, and groundwater flow analysis.

In 1987, U.S. EPA and PMC signed another AOC agreeing to conduct a full Remedial Investigation and Feasibility Study (RI/FS) to determine the nature and extent of contamination and investigate appropriate remedial alternatives to address the contamination. PMC started the work planning phase of the AOC when in 1990 the U.S. EPA relieved PMC of conducting further RI/FS work. The U.S. EPA took this action because of delays in PMC developing a work

plan and PMC's uncertain financial situation which brought in question PMC's ability to complete the work as required by the AOC. Also in 1990, the U.S. EPA entered into the State Cooperative Agreement with the MDEQ, with the State agreeing to perform the RI/FS with funding provided by U.S. EPA.

In 1992, MDEQ retained EDER Associates to develop a work plan and to implement the investigation of soil and groundwater contamination. Remedial investigation (RI) field work was conducted from September 1992 through March 1993. Data collected during these field activities were used to complete a "Phase I" draft RI report in December 1993. U.S. EPA and MDEQ's review of this report revealed data gaps and the need for additional investigations. MDEQ retained Malcolm-Pirie, Inc., to conduct the follow-up "Phase II" investigation and to prepare a RI Report to address all of the relevant data collected to that date.

Concurrently with the State-led RI, U.S. EPA began a Focused Feasibility Study to examine the impact of site-related contamination on the Ingalls Well. In 1993, because of the uncertainty associated with future concentrations of VOCs in the Ingalls Well, U.S. EPA proposed that an air stripper be constructed at the Ingalls Well to reduce existing levels of VOCs, especially TCE, in the well and to ensure that the city's water supply was not adversely impacted by VOC contamination detected in groundwater near the Ingalls Well. This action was proposed as an interim action to "fully ensure" protection of the city's water supply with regard to PMC site.

In 1995, U.S. EPA signed a Interim ROD for providing on-line treatment of groundwater at the Ingalls Well. Air stripping was identified as the appropriate treatment technology, with carbon treatment as a contingent remedy. The State of Michigan requested that the city's construction of a new drinking water source be considered an enhancement of the selected remedy under 40 CFR 300.515(f). Because enhancement of the selected remedy was requested and specifically permitted under the ROD, U.S. EPA agreed to contribute the capital cost of the selected remedy to be used to the state to partially defray the city's cost of replacing the Ingalls Well. Therefore, U.S. EPA's selected remedy on an air-striper on the Ingalls Well was not implemented. In late 1997, the City of Petoskey completed the construction of its replacement municipal wells and use of the Ingalls Well ceased.

In February of 1998, the MDEQ released the Phase II RI Report. The report summarized soil results from the Phase I (Eder) and Phase II (Malcolm-Pirie) site investigations and groundwater data from Phase II sampling.

In September 1998, U.S. EPA issued another ROD to select the remedies for soil and groundwater at the Site.

Basis for Taking Action

In 1981, PMC was identified by the U.S. EPA and the MDEQ as the source of contamination at the Petoskey Municipal Well Field site. In 1982, under direction of MDEQ, PMC removed contaminated soil from the west side of building, backfilled the excavation, and capped it with a polymembrane liner and a small amount of soil. Following the removal of the contaminated soil,

TCE concentrations in the Ingalls Well decreased significantly from 50 part per billion (ppb) to approximately 4.0 ppb and have more recently remained relatively stable in the 1 to 3 ppb range.

IV. Remedial Actions

Remedy Selection

On September 30, 1998, U.S. EPA issued a Record of Decision (ROD) which selected the following remedy:

-Installation and operation of a Soil Vapor Extraction (SVE) system to remove TCE from deep, unsaturated soils.

-Excavation and off-site disposal of the contaminated soil that exceed MDEQ's residential direct contact criteria and Groundwater/Surface Water Interface (GSI) criteria for protection of surface water used as a drinking water source.

-Deed restrictions in accordance with Michigan Natural Resources and Environmental Protection Act Part 201 due care requirements for the landowner's responsibilities if the current structure of PMC property is partially or totally removed.

-Use of a natural attenuation and monitoring program for groundwater contamination for the most beneficial use of the aquifer. Installation of additional groundwater monitoring wells in the area between PMC facility and Lake Michigan, and monitoring of groundwater contaminant levels until compliance with MCLs and MDEQ's GSI criteria is achieved. A Contingency Plan will be provided in the Long-term Groundwater Monitoring Plan and will be implemented to protect human health and environment if the groundwater contaminant concentrations are failing to decrease or begin to increase over time.

-Deed restrictions to prohibit the future use of the groundwater for private property because the current municipal ordinance may be insufficient to prohibit the construction and use of groundwater.

Contingency Plan for Follow-Up Actions

The 1998 ROD required that the Contingency Plan will be included in the Long-Term Monitoring Plan to evaluate when and how follow-up actions will be implemented if the selected remedies fails to result in sufficient reductions in groundwater contaminant concentrations. The Contingency Plan will require an evaluation of the impacts of the exceedance, potentially leading to increased monitoring, the implementation of active groundwater extraction/treatment, and additional source control action, or other suitable methods, to prevent further release of contaminants to the surface water body. These measures may include: groundwater pump-and-treat (either within the aquifer or localized at the PMC property); groundwater bioventing and/or

biosparging; enhanced biodegredation of contaminants in the plume; in-well stripping; a combination of these procedures; or other technology approved by the U.S. EPA, in consultation with MDEQ, as suitable for remediation.

Remedy Implementation

The 1998 ROD estimated that a large area of the PMC property would need to be excavated to a depth of 5 feet. While there were several exceedances of residential direct contact criteria that were driving the removal of a small volume of soil (approximately 15 cubic yards), the vast majority of the soils (approximately 2,000 cubic yards) were planned to be removed to prevent the leaching of low-level contamination to groundwater in excess of the State's GSI standards. The goal was and is to achieve and maintain acceptable groundwater contaminant levels, not necessarily to meet the GSI soil criteria at all locations. In an effort to ensure that the cleanup design provided the maximum removal of contaminated material, U.S. EPA reevaluated the area and depth of excavation that would be most appropriate for the site.

Since inorganic contaminants (such as zinc) were most prevalent in surface soils, the excavation area was modified by U.S. EPA during the design (Attachment 3). The redefined area of excavation included a large area of the site where excavation to 2 feet would remove the majority of soils that exceed GSI soil criteria (mostly for zinc) and eliminate possible concerns about surface concentrations of lead (the RI data included many large composite samples that could not resolve questions of whether surface zinc would be a concern based on possible future land use). Two areas of the excavation, which were intended for excavation to 5 feet in the ROD, were still identified as requiring excavation to 5 feet due to higher levels of contamination and the need to remove all soils exceeding MDEQ's direct contact criteria. Also, one area of the excavation at the northwest corner of the building was excavated to 7 feet, and verification sampling was conducted by MDEQ, due to historical seeps of hydraulic fluid through the building walls and exceedances of MDEQ's direct contact criteria. In an innovative effort to best utilize funds and speed the cleanup (both during RD and during field work), U.S. EPA and MDEQ agreed that preparation of a Quality Assurance Project Plan (QAPP) and the implementation of verification sampling would not be necessary if the excavation boundaries were drawn with sufficient conservatism. Thus, by over-excavating in areas where direct contact exceedances had been identified, the Agencies could be assured that these areas had been sufficiently remediated, and the extra soil removed added to the long-term protectiveness of the remedy by eliminating soils with the potential to leach to groundwater in excess of GSI criteria.

The Remedial Design was completed in October 1999. The remedial action construction activities began after U.S. EPA approval of the work plan in October 1999. The construction work was separated into a soil excavation unit and SVE unit:

> -Soil Excavation unit: Excavation of contaminated soil began on November 1, 1999. U.S. EPA's contractor excavated approximately 2,500 cubic yards of contaminated soil at the northern portion of the property. The excavated soil was transported and disposed in a non-hazardous landfill approved by U.S. EPA. All areas disturbed during the RA were backfilled with clean soil and seeded or covered with gravel, consistent with the original

conditions.

-SVE unit: The SVE system was installed in November 1999 by U.S. EPA's contractor. Initially, the SVE system was planned to run for 45 days. But due to the low volatilization of the TCE during the winter time and the higher TCE concentration on the soil vapor sample during the summer, the SVE system was operated over three time periods.. The first period was from November 1999 through December 1999. During this period, the SVE system was operated under a variety of vacuum pressures to minimize water uptake and maximize organic vapor removal. The second period was from May through July 2000. The third period was October through December 2000. During the third period of the SVE treatment, the packers were added to the extraction wells in order to isolate and increase the rate of extraction from lower areas of the vadose zone. The SVE system was totally discontinued and dismantled on December 27, 2000. Approximately 753 grams of TCE was removed from the subsurface by the SVE system during the three treatment periods.

As the PMC soils have been addressed by SVE and excavation, the residual contaminated groundwater is naturally attenuating, with the remaining contamination diluting, dispersing, and discharging into Lake Michigan. Contaminated groundwater has been naturally moving to and discharging into Lake Michigan for approximately twenty years.

On February 18, 2000, a Preliminary Close-Out report was signed. This document indicated that the remedial construction activities had been completed at the site.

In June 2002, a Baseline Groundwater Monitoring Sampling was conducted by the MDEQ. The purpose of this sampling event was to update the groundwater data, to refine the parameter list, to determine the need for additional monitoring wells and/or wells to be decommissioned with which to provide the information to assist in designing the long-term groundwater monitoring plan for the site. The Baseline Monitoring Technical Memorandum Report was submitted by the MDEQ in September 2002. Based on the Baseline Monitoring Tech Memo, U.S. EPA concluded that with the cessation of the pumping at the well and the source remediation, the TCE plume still appears to be in the same area as previously identified and there is little evidence of the other contaminants of concern. Comparing the 1995 groundwater data to the September 2002 Baseline Groundwater Monitoring data, there is a decreasing trend of the concentrations in some wells. However, there are some increases or no change at the others wells.

On June 2004, U.S. EPA tasked MDEQ to conduct the Water Level Data Collection and Monitoring Well Casing Elevation Survey. The purpose of this event was to collect data to determine the actual flow direction or directions and the amount of change with time caused by fluctuations in regional groundwater, the effects of Lake Michigan and changes in barometric pressure. These information will assist to prepare the long-term groundwater monitoring plan for the Site.

V. Progress Since the Last Review

This is the first five-year review for the Site.

VI. Five-Year Review Process

Administrative Components

The PMC Five-Year Review was conducted by Giang-Van Nguyen of U.S. EPA, Remedial Project Manager for the PMC Superfund Site with the assistance of MDEQ staff as a representative for the State Agency.

The components of the five-year review include the following:

- community involvement;
- document review;
- data review;
- site inspection; and
- five-year review report development and review.

Community Involvement/Interviews

U.S. EPA published notice of the five-year review in the Petoskey News-Review in November 2004. No site interviews or public meeting were conducted due to very minimal community interest at the Site.

Document and Data Review

The list of documents and data reviewed in preparing for this Five-Year Review Report is listed in the attachment 2 entitled "List of Documents Reviewed."

Site Inspection

An inspection at the Site was conducted on September 21, 2004, by the Site Remedial Project Manager, Ms. Giang-Van Nguyen, and the State Hydrologist, Mr. William Bolio. The purpose of the inspection was to assess the protectiveness of the remedial action performed at the Site. The climatic conditions at the time of the site visit were sunny and temperature was in the 70's degree fahrenheit. Based on the site inspection, all existing PMC building have been demolished. Most of demolition area is covered with clean soil except the western half area of the property where the remained soil exceeded only GSI criteria. These soils were covered a with PVC membrane to prevent storm water infiltration and storm water contact with impacted soils until construction resumes in the spring of 2005. When development of the western portion of the property begins in 2005, the soils that will not be covered by impermeable surfaces will be removed and transported to the landfill for disposal. On the surface, there are still exposed pieces of broken concrete and fragments of the underlying bedrock. There is no fence restricting access to the Site except the silt fencing was installed along the low area including around the

north, west, and east site of the former building to prevent sediment from leaving the site in storm water. Current site photographs are attached to this report (Attachment 5). Children were observed during the inspection riding their bicycles around the Site. Most the existing monitoring wells are in good condition except PW-201D. PW-201D appeared have no lock and no flush mount and needs to be fixed. MW-201S, MW-202S, MW-203S, MW-203D and MW-204S were abandoned because they located on the footprint of the new building structure. MW-202S will be replaced at a location northeast of the current location. A new well will be installed as requested after site work has been completed.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents? Yes

Remedial Action Performance

The review of documents, ARARS, risk assumptions, and the results of the Site inspection indicate that the remedy is functioning as intended by the Site RODs. The excavation of contaminated soils during the RA and recently by the developer, and the SVE system have achieved the remedial objectives to minimize the migration of contaminants to groundwater, and to prevent direct contact with, or ingestion of, contaminants in the groundwater and soil.

Implementation of Institutional Controls and Other Measures

Institutional Controls for the Site have not yet been put into place; however it is anticipated that these measures will be in place by the end of calendar year 2005. U.S. EPA will work with the City and the developer to ensure that this happens.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid? Yes

Changes in Standards and To Be Considered Criteria

There have been no changes in ARARs and no new standards or To Be Considered criteria affecting the protectiveness of the remedy since the start of remedial construction at the Site.

Changes in Exposure Pathways

Although there have been a change in the physical conditions of the Site it is consistent with the RODs and does not affect the protectiveness of the remedy.

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures (adolescent trespasser and PMC worker) and potential future exposures (generic residential use, limited residential use - basement construction and construction worker.)

Changes in Toxicity and Other Contaminant Characteristics

Neither the toxicity factors for the contaminants of concern nor other contaminant characteristics have changed in a way that could affect the protectiveness of the remedy. U.S. EPA will review the groundwater monitoring data from the quarterly and annually groundwater monitoring program to track the relative percentages of the breakdown products of TCE. Some of the breakdown products of TCE, such as vinyl chloride, are more toxic than TCE; however, significant breakdown of TCE has not been detected to date.

Changes in Risk Assessment Methods

There have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Expected Progress Toward Meeting Remedial Action Objectives

The remedy is progressing as expected. Remedial action objectives have either been met (all TCE sources have been removed) or are progressing in a manner that is acceptable and is expected to result in the remedial action objectives being met within a reasonable time frame (groundwater natural attenuation), and the groundwater monitoring program will be implemented to ensure that any changes in contaminant levels will be detected and addressed, if necessary.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No.

No ecological targets were identified during the baseline risk assessment and none were identified during the five-year review, therefore monitoring of ecological targets is not necessary. There is no other information that could effect the protectiveness of the remedy for the Site.

Technical Assessment Summary

There have been no changes in the physical conditions of the site that would effect the protectiveness of the remedy. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

VIII. Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Deed restriction for the future use of groundwater need to be implemented	N	Y
Implement the Long-term Monitoring plan for groundwater	N	Y

IX. Recommendations and Follow-up Actions

Issue	Recommendations /Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes or No)
Institutional Controls	Need to be implemented	City of Petoskey and developer	U.S. EPA	December 2005	N-current Y-future
Long-term monitoring plan	Need to be implemented	U.S. EPA	U.S. EPA	June 2005	N-current Y-future

X. Protectiveness Statement(s)

The remedy at the Site currently protects human health and the environment in the short-term because all soils that exceed a direct contact threat and vapor intrusion or have potential to leach to groundwater at levels in excess of chemical-specific ARARs were removed. However, in order for the remedy to be protective in the long-term, the following actions need to be taken:

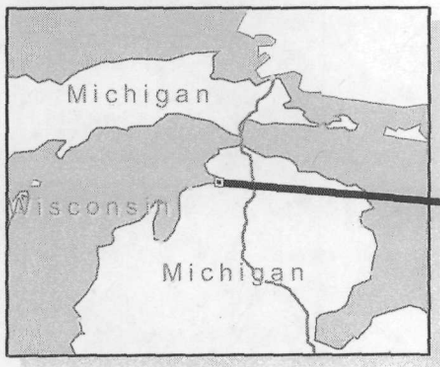
-Place the deed restriction for the future use of groundwater on the property
-Implement the long-term monitoring plan

XI. Next Review

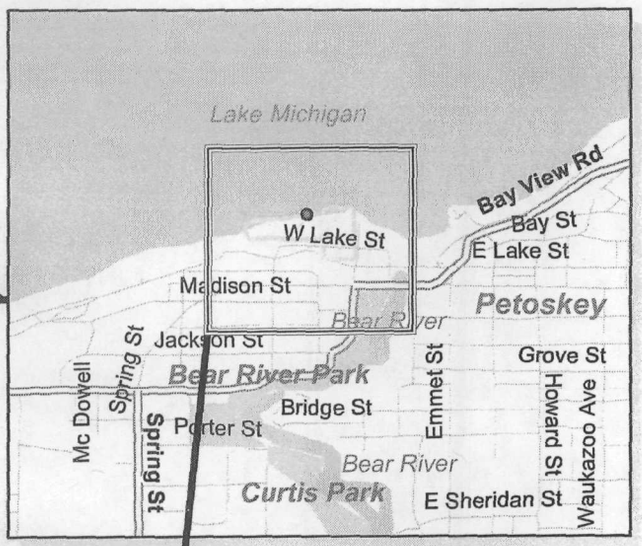
The next five-year for the PMC Superfund Site is required by March, 2010, five years from this review.

Petoskey Municipal Well Field
Emmet County, Michigan

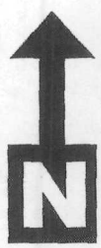
1) State



2) Emmet County



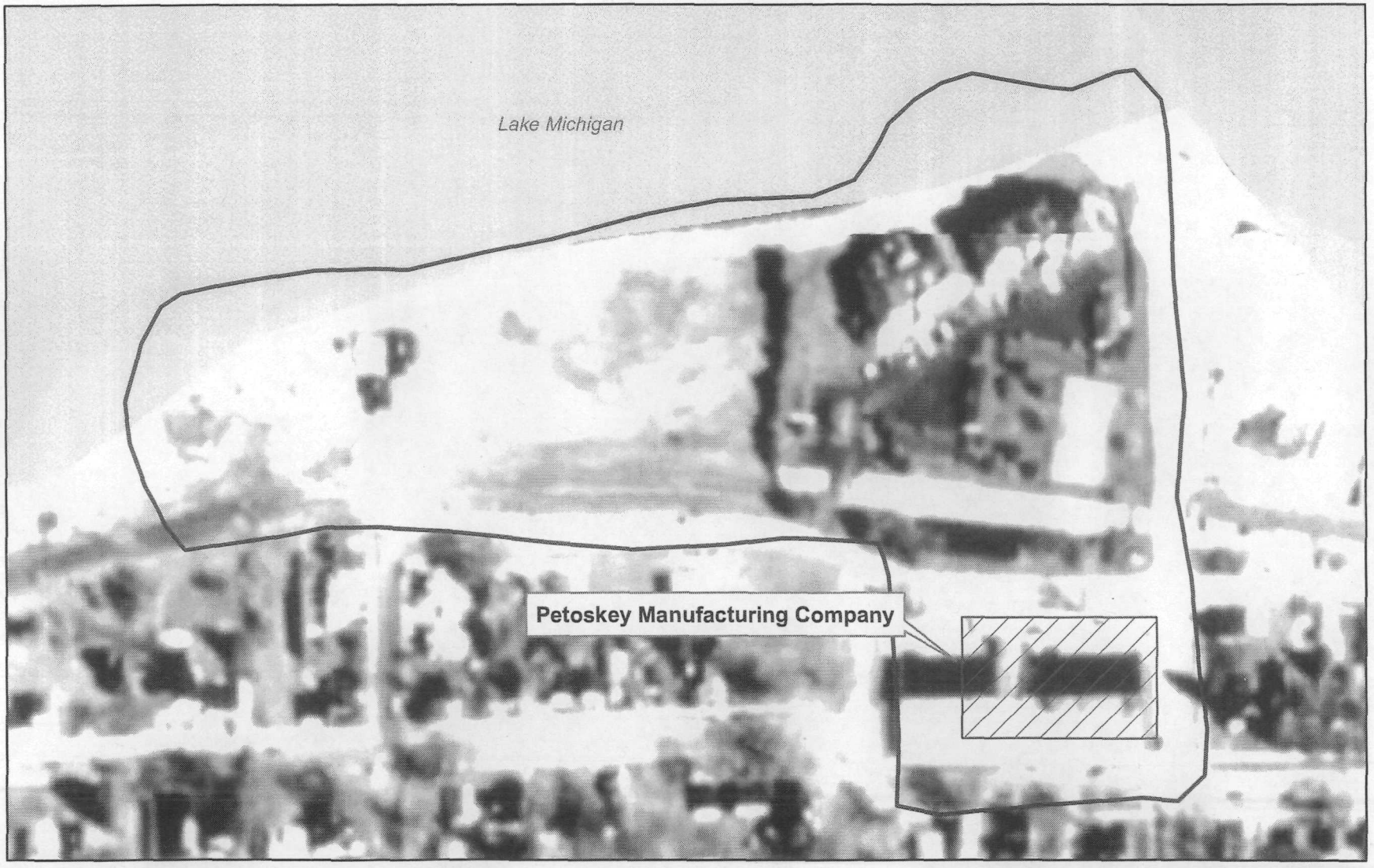
3) Petoskey Municipal Well Field



Plot created by David Wilson U.S. EPA Regon 9/5/2002
Color Infra-Red Image Date: 4/23/1996

Figure 1

Petoskey Municipal Well Field
Site Area Layout



Site Polyline
Site Area Layout

N

GEOS

Figure 2

0 15 30 60 90 120 Meters

Created by Eva Sinha U.S. EPA Region 5 10/19/2004

ATTACHMENT 2

LIST OF DOCUMENTS REVIEWED

Attachments 2

List of Documents Reviewed

Phase I Draft Remedial Investigation Report, Eder Associates, December 1993

Record of Decision, September 1998

Phase II Remedial Investigation Report for Petoskey Municipal Well Field Site, Malcolm Pirie Engineers, LLP, February 1998

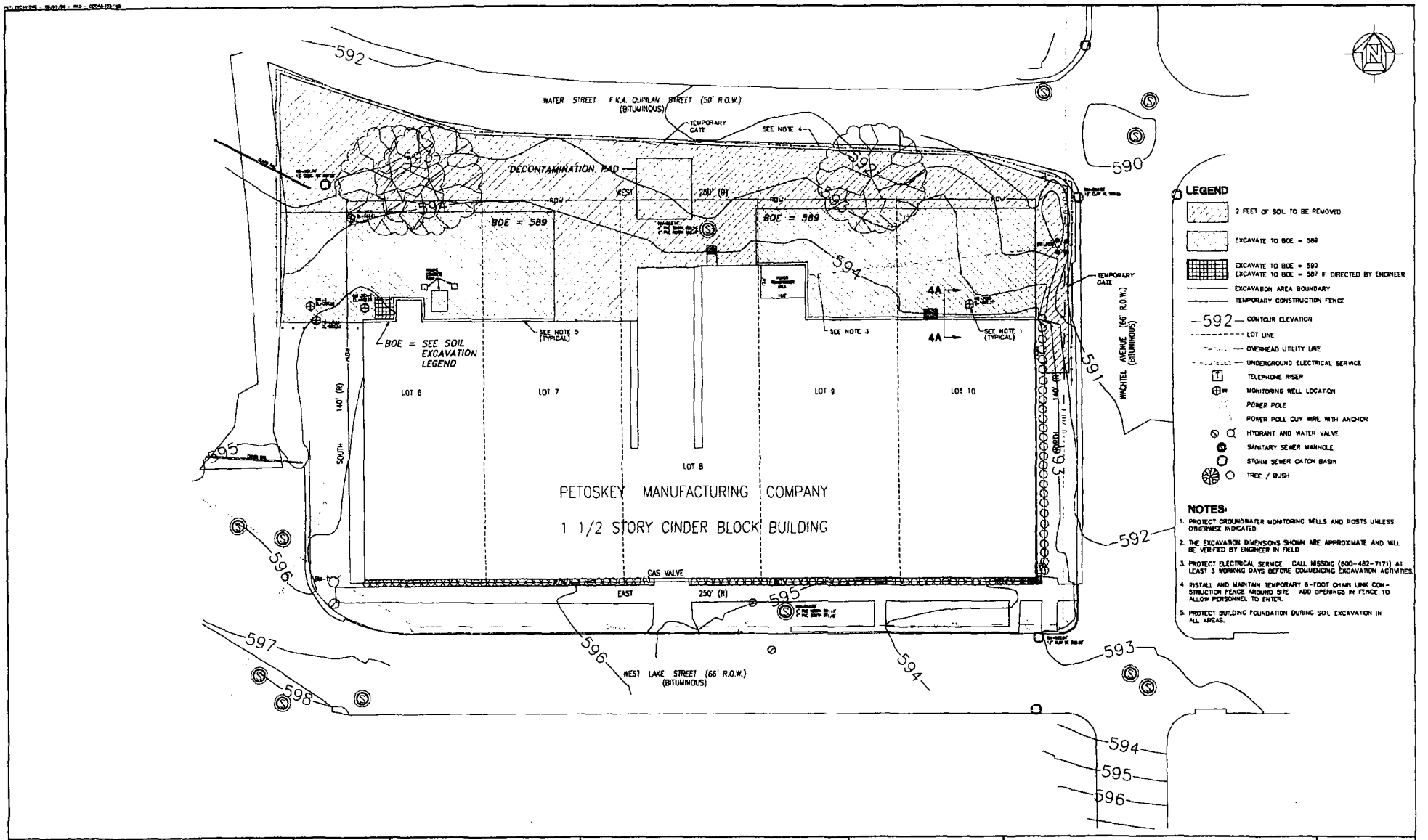
Soil Remediation and Documentation Summary, Tetra Tech EM Inc, February 23, 2001

Feasibility Study Report for Petoskey Municipal Well Field Site, Tetra Tech EM Inc., September 23, 1998

Baseline Technical Memorandum Report, Michigan Department of Environmental Quality, September 6, 2002

ATTACHMENT 3

EXCAVATION MAP

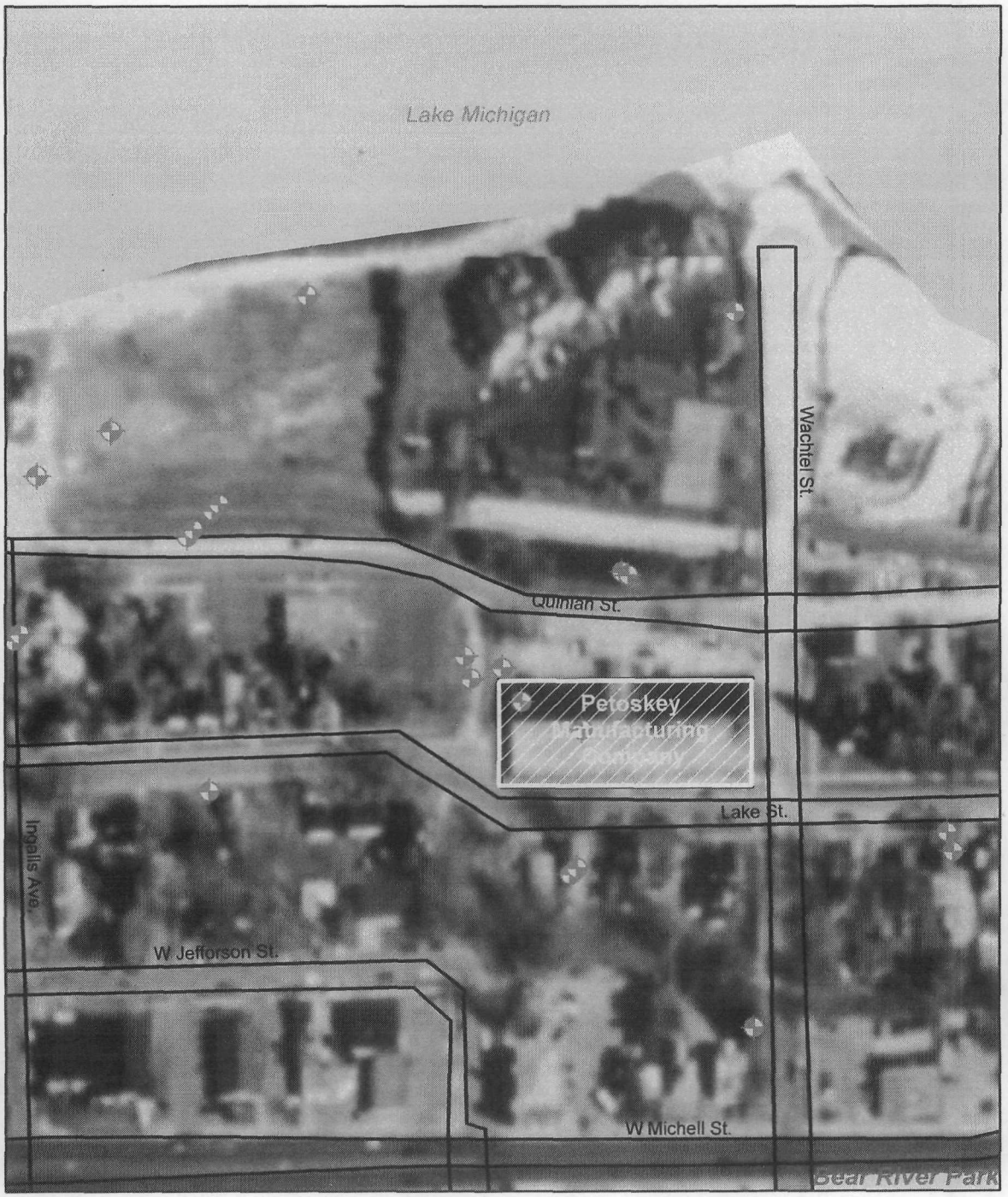


REVISIONS	DESIGNED M.A.J.	Tetra Tech EM Inc. CHICAGO, ILLINOIS	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION V PETOSKEY MUNICIPAL WELL FIELD SUPERFUND SITE SOIL EXCAVATION REMEDIAL ACTION WORK ASSIGNMENT NO. 038-RDRD-0554	SCALE 1" = 15'	SOIL EXCAVATION PLAN	SHEET 2 OF 4
	DRAWN R.A.Q.					
	CHECKED R.R.R.					
	DATE 7/30/99					PROJECT NO. 000AA.0351.02

ATTACHMENT 4

TCE CONCENTRATION MAPS

Petoskey Municipal Well Fields Site, MI



Well Site Location Map

Figure 3

Meters

0 50 100

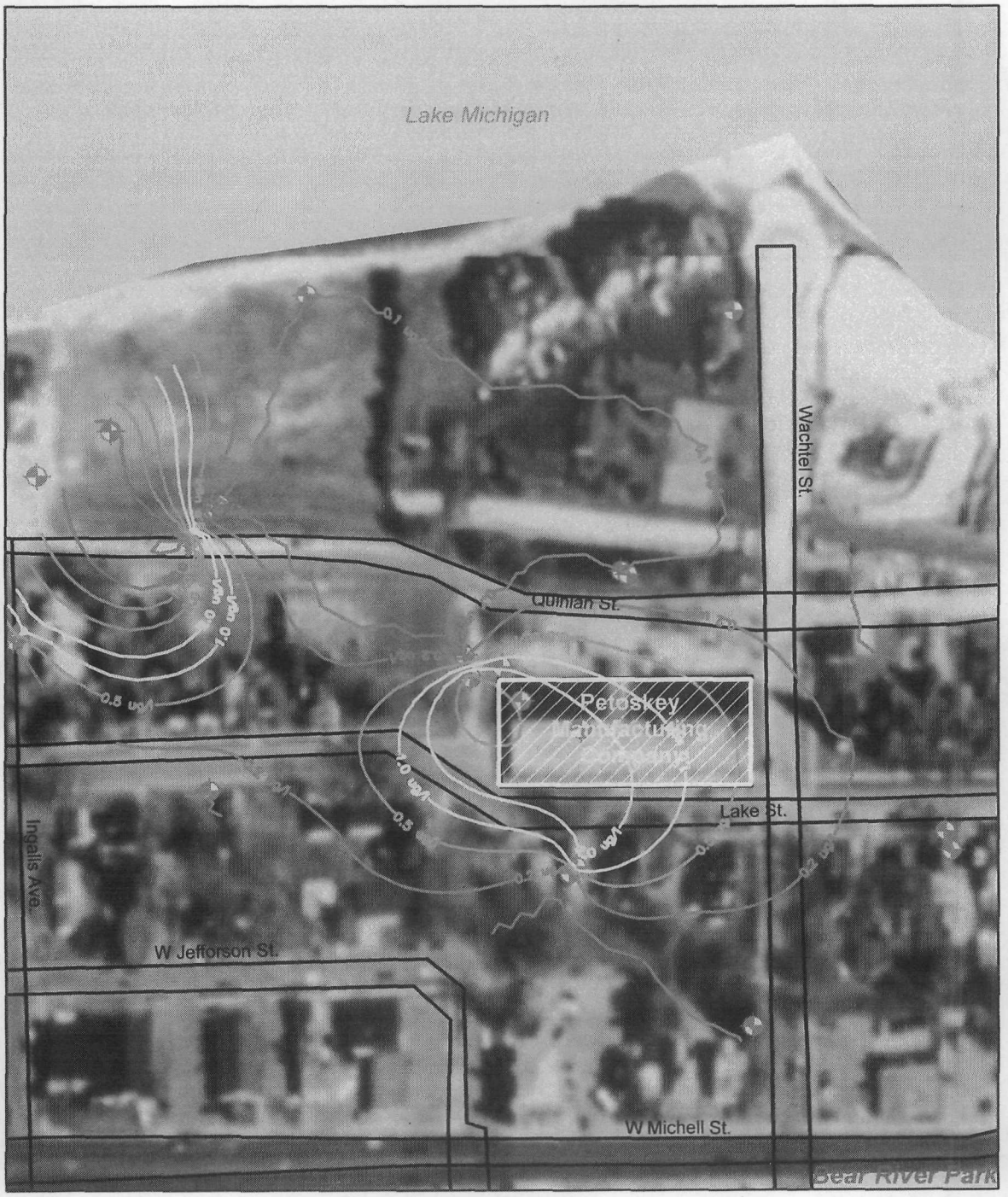
N

GEOS

Groundwater Evaluation and Optimization System

Created by Naseer Shafique U.S. EPA Region 5

Petoskey Municipal Well Fields Site, MI



TCE Concentration (ug/l) Map
December, 1992

Figure 4

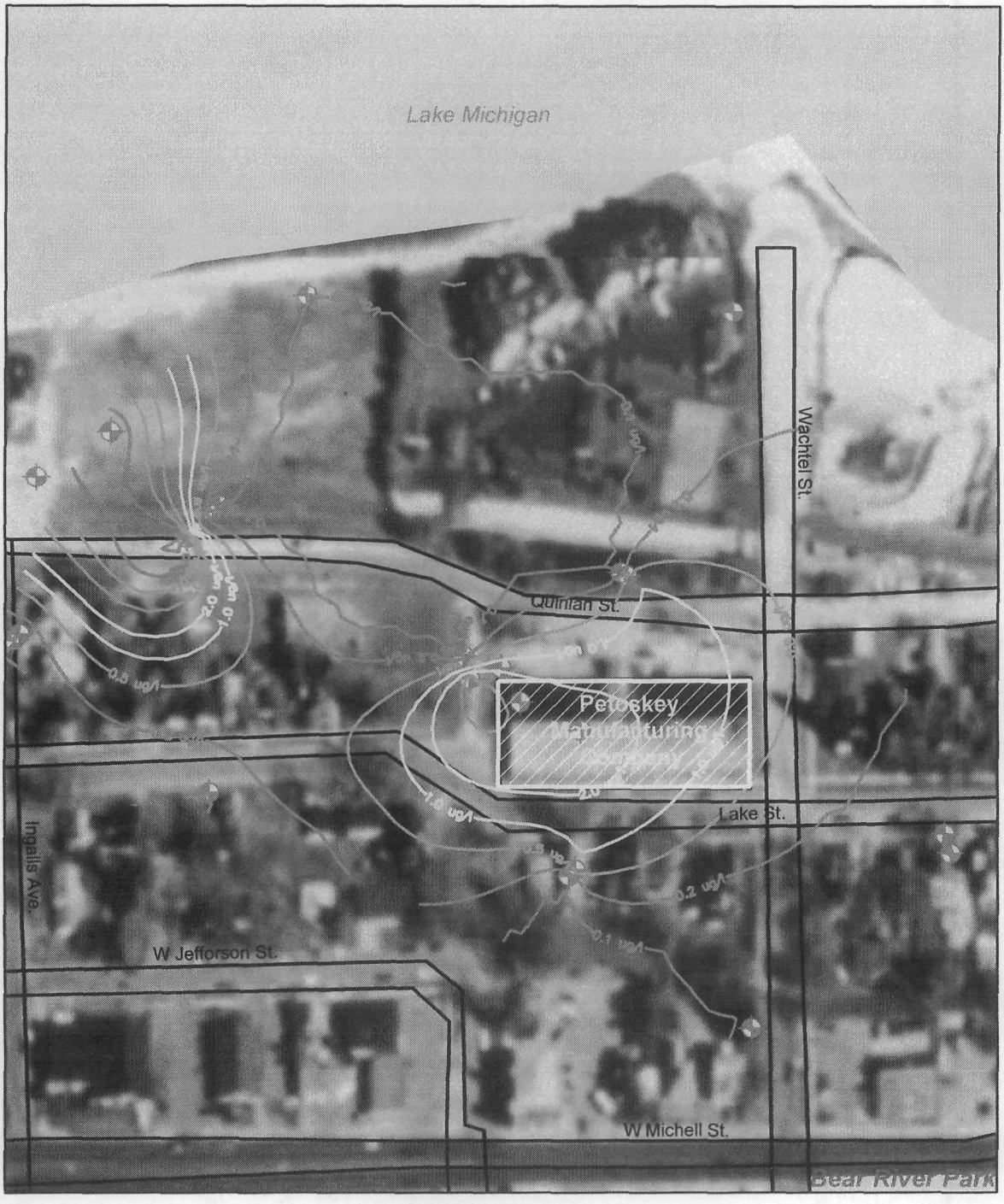
Meters
0 50 100

N

GEOS
Groundwater Evaluation and Optimization System

Created by Naseer Shafique U.S. EPA Region 5

Petoskey Municipal Well Fields Site, MI



TCE Concentration (ug/l) Map
March, 1993

Figure 5

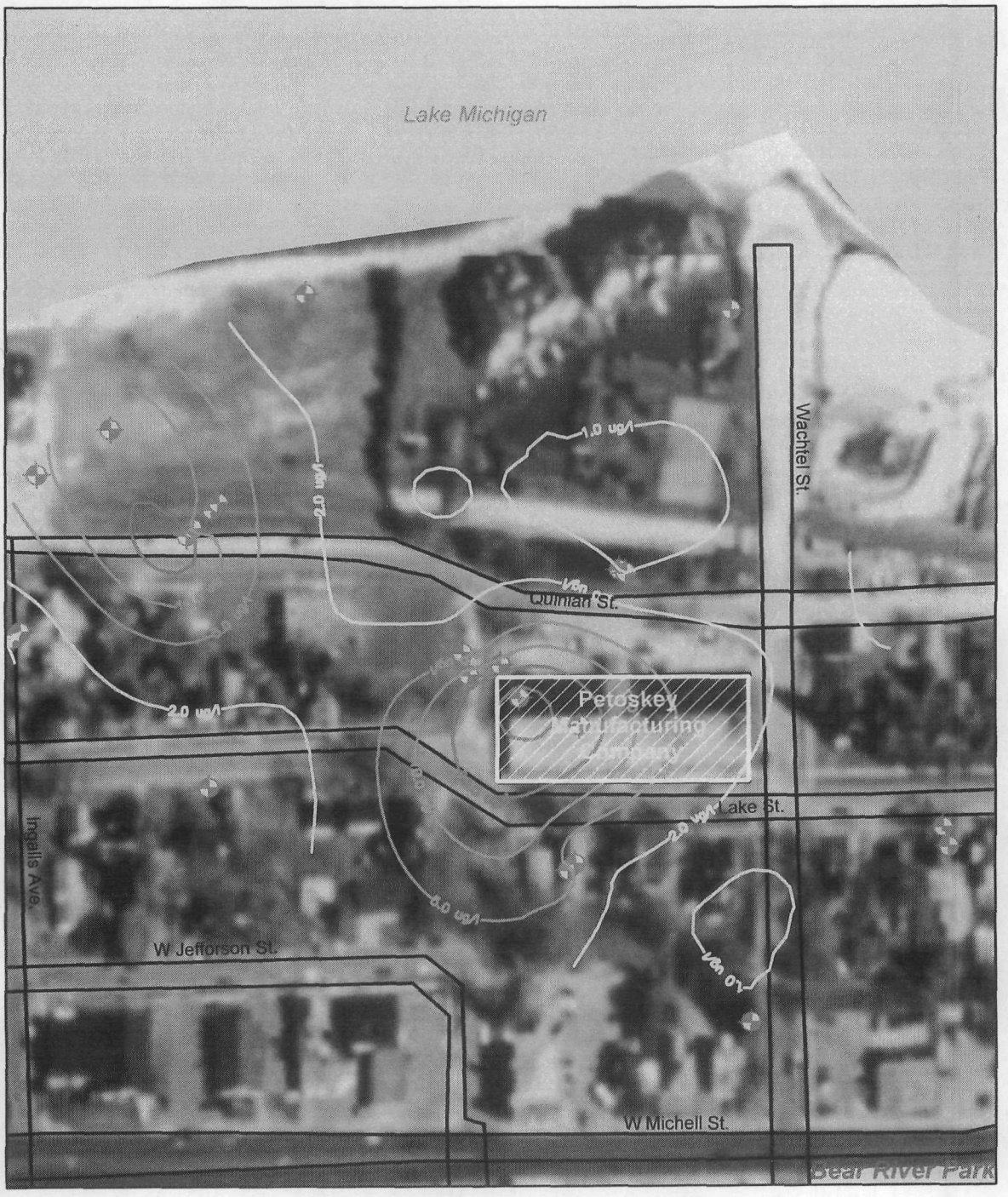
0 50 100 Meters

N

GEOS
Groundwater Evaluation and Optimization System

Created by Naseer Shafique U.S. EPA Region 5

Petoskey Municipal Well Fields Site, MI



TCE Concentration (ug/l) Map
October, 1995

Figure 6

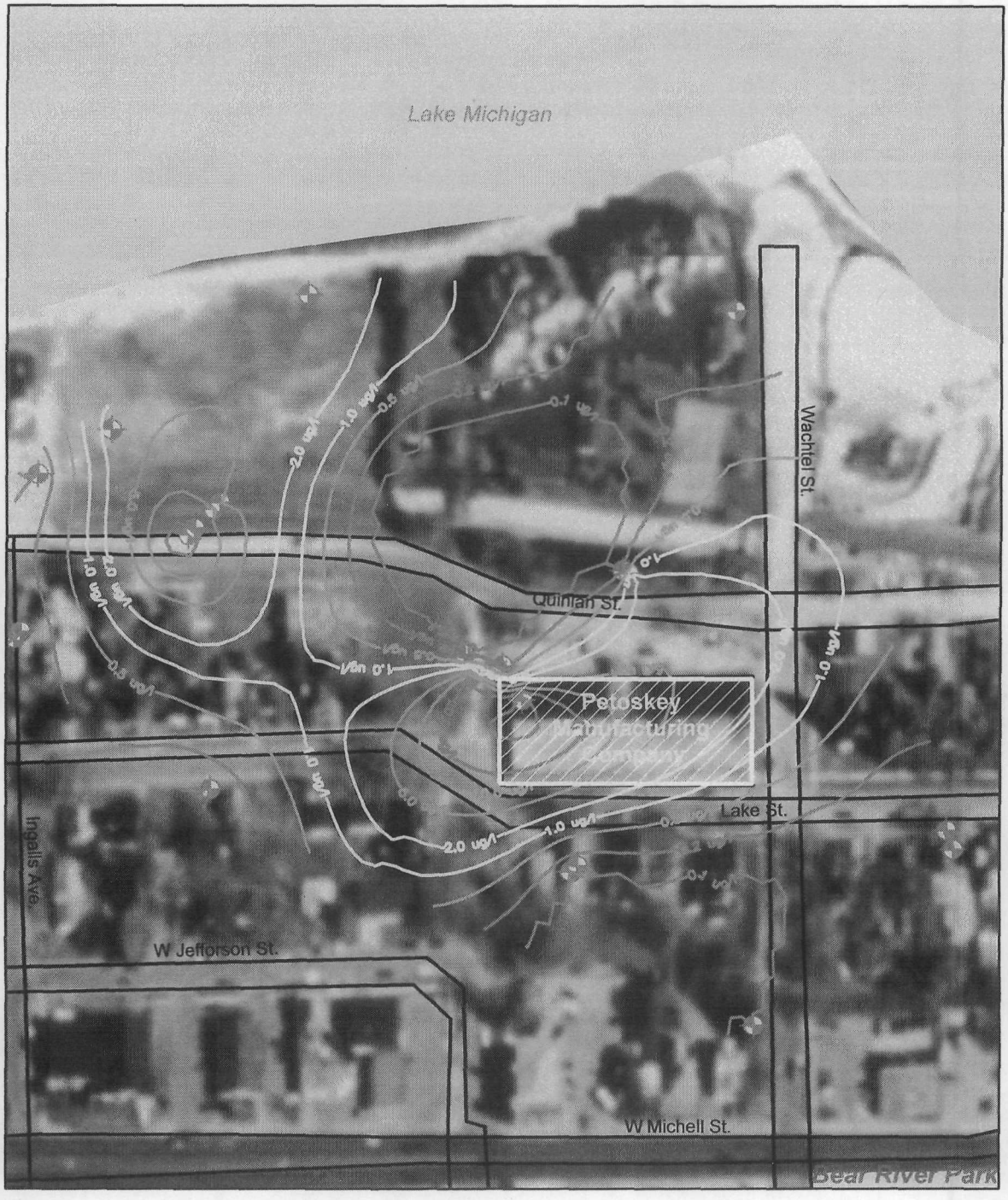
Meters
0 50 100

N

GEOS
Groundwater Evaluation and Optimization System

Created by Naseer Shafique U.S. EPA Region 5

Petoskey Municipal Well Fields Site, MI



TCE Concentration (ug/l) Map
June, 2002

Figure 7

0 50 100 Meters

N

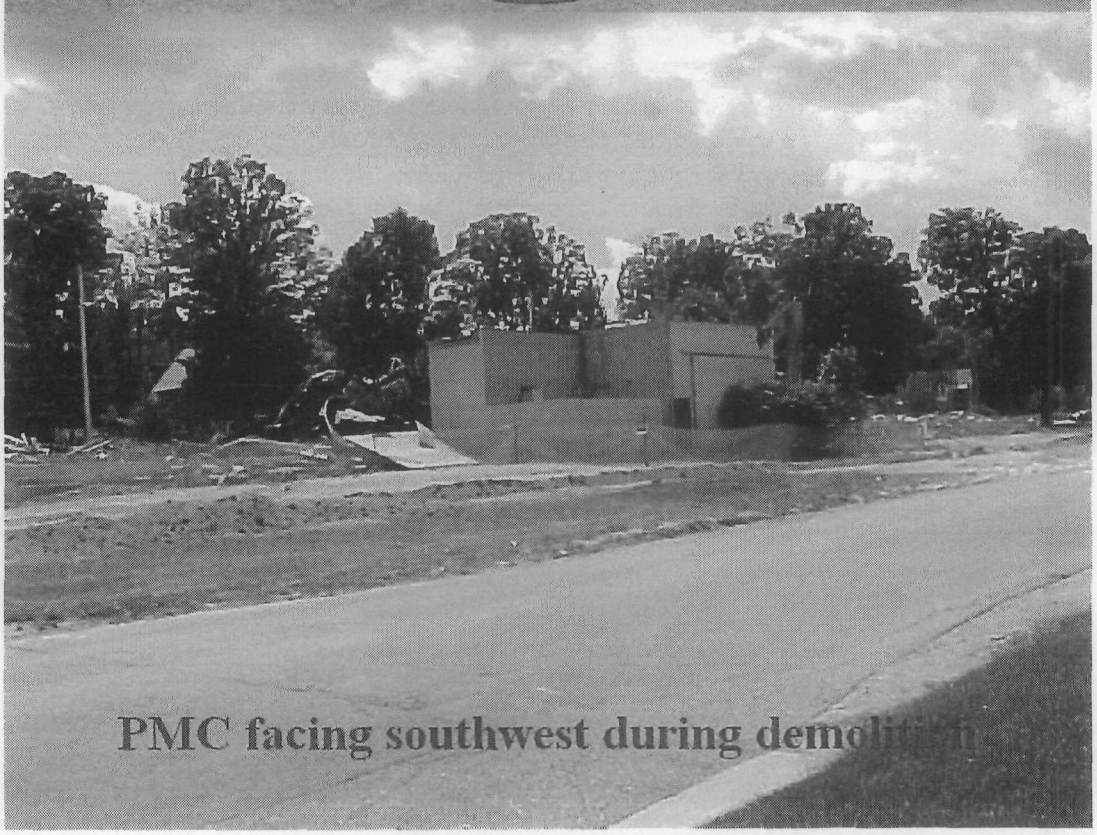
GEOS
Groundwater Evaluation and Optimization System

Created by Naseer Shafique U.S. EPA Region 5

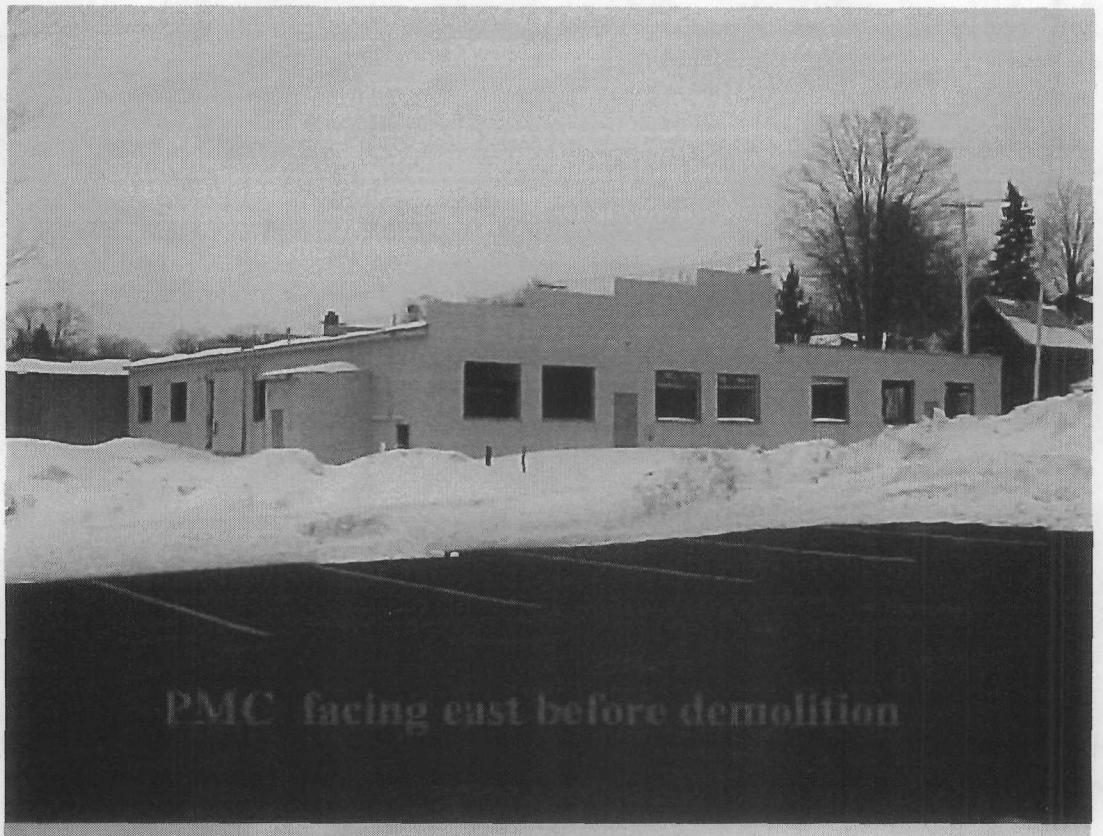
ATTACHMENT 5

PHOTOS DOCUMENTING SITE CONDITIONS

PMC facing southwest before demolition

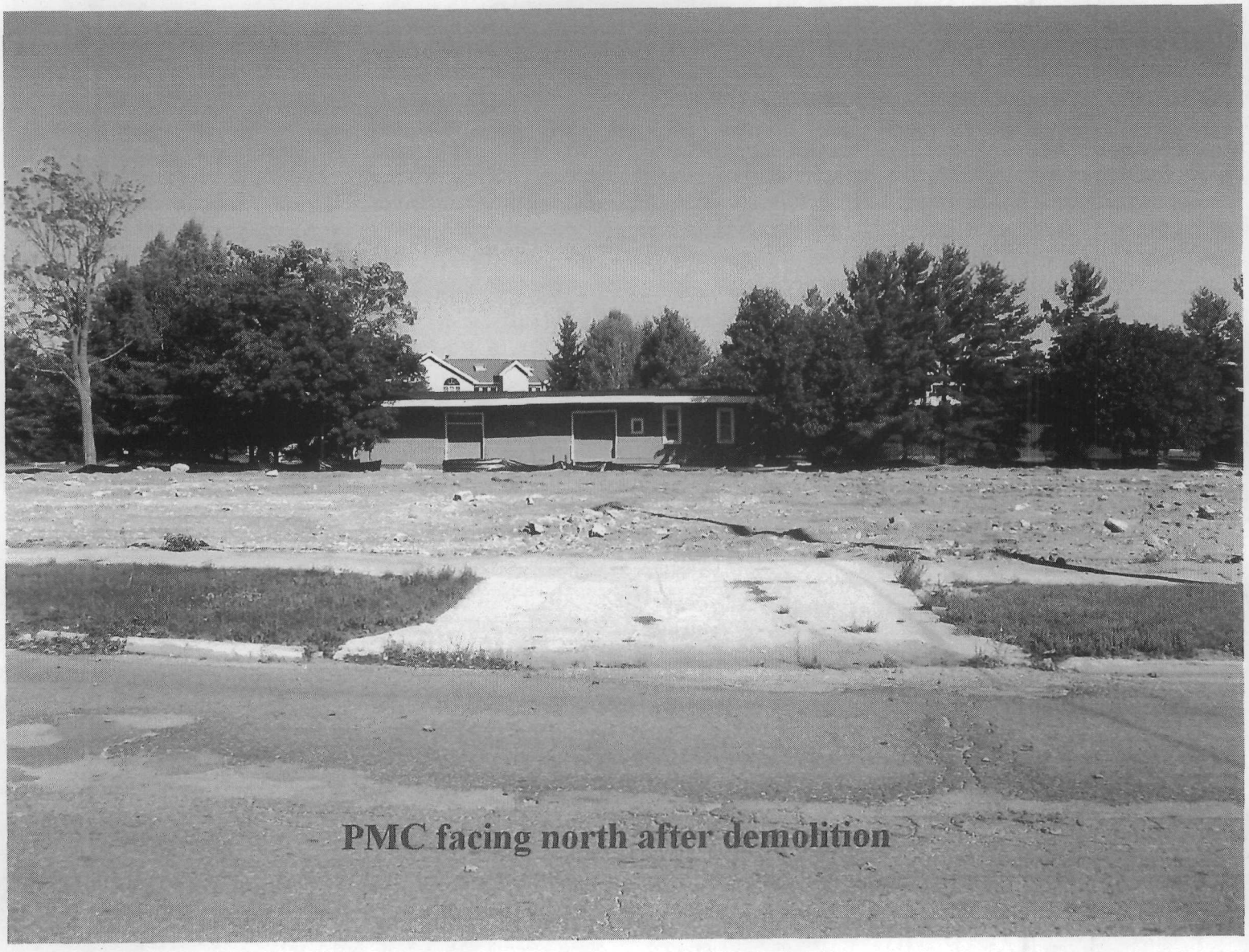


PMC facing southwest during demolition



PMC facing east before demolition

PMC facing east after demolition



PMC facing north after demolition

ATTACHMENT 6

EPA Response to MDEQ General Comments on November 2004 Draft Five-Year Review Report for the Petoskey Municipal Well Field Superfund Site, Petoskey, Emmet County, Michigan

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF SR-6J

February 2, 2005

Mr. George Jackson
Michigan Department of Environmental Quality
Constitution Hall
525 West Allegan Street
P.O. Box 30426
Lansing, Michigan 48909

Subject: Response to MDEQ General Comments on the November 2004, Draft Five-Year Review Report for the Petoskey Municipal Well Field Superfund Site, Petoskey, Emmet County, Michigan.

Dear Mr. Jackson:

The United State Environmental Protection Agency (the Agency) has prepared this response to comments (RTCs), which were received on November 17, 2004, for the Draft Five-Year Review Report for the Petoskey Municipal Well Field Superfund Site, located in Petoskey Emmet County, Michigan (Site). These RTCs are intended to address the comments raised by the Michigan Department of Environmental Quality (MDEQ) during reviewing the report. The draft Five-Year Review Report has been revised as appropriate.

The Agency's responses are provided in regular text following the MDEQ's comments, which is shown in italics.

1. Contaminated Soils

There are several samples from beneath the floor of the building, collected after the slab removal, that contained zinc, mercury, TCE, and PCE in excess of the soil drinking water protection criteria and GSI protection criteria. These contaminated soils may serve as a continuing source of contamination to groundwater and represent a threat to the drinking water exposure pathway.

In addition, MDEQ staff do not believe the soil data provided by the developer's consultant for due care purposes adequately delineates or characterizes existing soil contamination for remedial purposes. This soil sampling did not use a statistical sampling strategy to determine

the number or location of soil samples. Moreover, only two soil samples were preserved with methanol and sent to a fixed base laboratory for analysis of volatile organic contaminants and confirmation of the field results. All other samples were analyzed in the field by gas chromatograph. Unfortunately, there was poor agreement between the lab results and field gas chromatograph results. Because of these issues, there are uncertainties associated with the levels and extent of contamination and the natural attenuation monitoring will need to be carefully designed to allow for unanticipated migration of contaminants in the soil above the GSI and drinking water protection criteria.

Agency Response. We agree that there are issues associated with the soil data provided by the developer. We will consider these and any other concerns, as appropriate, during the preparation of the Natural Attenuation Monitoring Plan.

2. Groundwater Monitoring

The last sampling of the existing wells was conducted in June 2002. Additional samples need to be collected from the existing monitoring wells to identify and demonstrate the levels of contaminants in these wells. Moreover, the water level survey indicates that the groundwater flow direction may be more northwesterly than previously thought and an additional well(s) may be needed in this direction.

Agency Response. Please submit the results of the water level measurement survey as we will need the information for the preparation of the Natural Attenuation Monitoring Plan.

3. Natural Attenuation Monitoring

The Five-Year Review does not identify how the long-term groundwater monitoring plan will address long-term compliance with maximum contaminant levels (MCLs) and compliance with GSI criteria.

According to the MDEQ water level survey, additional monitoring wells are needed at locations where migration of contaminated groundwater has not been clearly evaluated. The Five-Year Review needs to identify the installation of additional monitoring wells where these data gaps exist and include a sampling program which details the sampling frequency and parameters that will be evaluated.

U.S. EPA Response. Since the MNA plan has not been completed, the details of how the MNA plan will address long-term compliance with MCLs and GSI criteria is not possible at this time. We will consider these issues as we develop the MNA plan.

4. Institutional Controls

MDEQ staff need to review deed restrictions that are part of the remedy for this site. The Record

of Decision (ROD) requires implementation of the following deed restrictions:

- *"Prohibit groundwater use associated with the contaminant plume where contaminant concentrations exceed or approach MCLs or Michigan Drinking Water Standards (Act 399)." This means deed restrictions both on the PMC property and on properties where the plume has migrated and concentrations approach or exceed MCLs.*

- *"A deed restriction will also be placed on the PMC property indicating that, if the property is redeveloped and the building is removed (partially or totally), the landowner is responsible for implementing the "due care" provisions of Michigan Part 201. The deed restriction will also require (if soils under the building are uncovered) the property owner to determine if there is a threat to human health and the environment and/or exceedances of Michigan 's chemical-specific ARARs, conduct any follow-up action (i.e., additional investigation and disposal) necessary for any development of the property, and not exacerbate an existing condition."*

In addition to the deed restrictions required in the ROD, the PMC property should also include a deed restriction that prevents construction of buildings with basements or requires that a thorough investigation of deep soils be completed to demonstrate that basements can be constructed without creating hazards to building occupants or construction workers. This deed restriction is necessary in the event that the current development is not built and another development project with basements is considered.

Agency Response. The City of Petoskey is willing to include the deed restriction on the City contract with the developer. EPA, in consultation with MDEQ, will work with the City to have an appropriate deed restriction placed on the Site. Attached is the Draft of the Restrictive Covenant for your review.

5. Contingency Plan

The Five-Year Review did not identify the contingency plan component of the 1998 ROD. In the event that the soil remediation does not appear to be achieving MCLs/GSI criteria, additional source area remediation and/or groundwater extraction measures will need to be implemented.

U.S. EPA Response. The Five-Year Review Report has been revised to identify the contingency plan component of the 1998 ROD.

All the above issues need to be considered and addressed to assure that the remedy will be protective. When all elements of the final remedy are in place, we believe the remedy will be protective. However, the protectiveness statement as currently drafted is inaccurate and needs to be modified so that it better reflects current conditions.

U.S. EPA Response. Since the most contaminated soils that either exceeded a direct contact threat and vapor intrusion threshold or have the potential to leach to groundwater from the Site have been removed, EPA believes that the current remedy is protective of human health and the environment in the short-term. We do agree, however, that additional work, including but not limited to placement of deed restrictions on the property, are necessary to determine if the remedy is protective in the long-term. The Five-Year Review Report has been revised to reflect this.

If you have any questions pertaining to these RTCs for the Five-year Review Report, please feel free to contact Giang-Van Nguyen at (312)886-6726.

Sincerely,

Thomas Short

Thomas R. Short Jr., Chief
Remedial Response Section #1

cc: Ms. Giang-Van Nguyen, U.S. EPA

ATTACHMENT 7

GENERAL CLEANUP CRITERIA AND SCREENING LEVELS FOR SOIL AND GROUNDWATER
PETOSKEY MANUFACTURING COMPANY SITE

TABLE 2-1

GENERAL CLEANUP CRITERIA AND SCREENING LEVELS FOR SOIL PETOSKEY MANUFACTURING COMPANY SITE

Parameter	Residential Drinking Water Criterion	GSI Criterion	Acceptable Background Value	Residential Direct Contact Criterion	Industrial Direct Contact Criterion
Antimony	4.3	--	2.40	150	1,600
Arsenic	23	70	1.97	6.6	100
Barium	1,300	130	527	30,000	320,000
Cadmium	6	0.13[a]	0.61	210	2,300
Chromium	30[b]	3.3[b]	5.19	2,000	22,000
Lead	1	0.19[a]	44.1	400	900
Mercury	1.7	0.17	0.12	130	1,400
Selenium	4	0.4	0.97	2,100	23,000
Silver	4.5	0.067	0.57	2,000	21,000
Zinc	240	22[a]	355	140,000	1,000,000
Cyanide	4	0.1	0.55	250	250
Trichloroethene	0.1	4	--	160	500
Acenaphthene	300	4.3	--	76,000	810,000
Benzo(a)anthracene	NLL	NLL	--	14	210
Benzo(a)pyrene	NLL	NLL	--	1.4	21
Benzo(b)fluoranthene	NLL	NLL	--	14	210
Carbazole	0.86	--	--	130	1,200
Dibenzo(a,h)anthracene	--	--	--	1.4	21
Phenanthrene	12	2.3	--	1,500	16,000

Notes:

All units are in milligrams per kilogram.

GSI = Groundwater/surface water interface (GSI criteria are draft and updated criteria will be specified in the record of decision [ROD] or in an addendum to the ROD)

NLL = Chemical not likely to leach under most soil conditions

= Selected cleanup criterion based on most stringent value of the various criteria presented; when most stringent criterion is less than background level, the acceptable background value is selected as the cleanup criterion

-- = Not applicable

a Based on the surface water non-drinking water value

b Based on hexavalent chromium

TABLE 2-2

GENERAL CLEANUP CRITERIA AND SCREENING LEVELS FOR GROUNDWATER PETOSKEY MANUFACTURING COMPANY SITE

Parameter	Residential Drinking Water Criterion	GSI Criterion
Antimony	6	--
Iron	300	--
Lead	4	14
Manganese	50	--
Silver	34	0.5
Thallium	2	3.7
4-4'DDT	2.5	0.02
bis(2-ethylhexyl)phthalate	6	--
Trichloroethene	5	29
Vinyl chloride	2	15
Chromium VI	100	11

Notes:

All units are in micrograms per liter.

GSI = Groundwater/surface water interface

▒ = Selected cleanup criterion based on the most stringent of the criteria presented above

-- = Not available or not applicable